299-E33-76 (A6884)

Log Data Report

Borehole Information:

Borehole:	299-E33-76 (A6884)		Site:	216-B-8 Crib	
Coordinates		GWL (ft)[1]:	141.4	GWL Date:	09/07/01
North	East	Drill Date	TOC[2] Elevation	Total Depth (ft)	Type
573831	137547	Feb. 1948	625.31 ft	150	

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Steel Welded	1.6	8 5/8	8	5/16	1.6	unknown

Borehole Notes:

When this borehole was swabbed, water was found inside the casing. The origin of this water is unknown; it may just be trapped inside the casing. The logging engineer measured the pipe stickup at the borehole using a steel tape. Calipers were used to measure casing OD and thickness only; the casing ID is calculated. Stickup was measured between survey points marked on the casing. Zero reference is the top of casing.

Logging Equipment Information:

Logging System:	Gamma 2B		Type: SGLS (35%)
Calibration Date:	09/00	Calibration Reference:	GJO-2001-245-TAR
		Logging Procedure:	MAC-HGLP 1.6.5

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2	3	4	5	6
Date	09/10/01	09/11/01	09/12/01	09/12/01		
Logging Engineer	Spatz	Spatz	Spatz	Spatz		
Start Depth (ft)	2.0	139.5	115.0	59.0		
Finish Depth (ft)	60.5	114.0	59.5	46.0		
Count Time (sec)	100	100	100	100		
Live/Real	R	R	R	R		
Shield (Y/N)	N/A[3]	N/A	N/A	N/A		
MSA Interval (ft)	0.5	0.5	0.5	0.5		
ft/min	N/A	N/A	N/A	N/A		
Pre-Verification	B0046CAB	B0049CAB	B0050CAB	B0050CAB		
Start File	B0048000	B0049000	B0050000	B0050112		
Finish File	B0048117	B0049051	B0050111	B0050138		
Post-Verification	B0048CAA	B0049CAA	B0050CAA	B0050CAA		
Depth Return Error	0	+0.07'	N/A	0		

Log Run	1	2	3	4	5	6
Comments	No fine-gain adjustments made during this log run.	No fine-gain adjustments made during this log run.	No fine-gain adjustments made during this log run.	Repeat section. No fine-gain adjustments made during this log run.		

Logging Operation Notes:

Zero reference is the top of casing. The pre-calibration files (B0046CAB, B0049CAB, and B050CAB) passed verification criteria. The post-calibration file, B0050CAA, was collected for only 300 seconds due to a mechanical malfunction with the truck.

Analysis Notes:

Analyst:	Sobczyk	Date:	09/17/01	Reference:	MAC-VZCP 1.7.9 Rev. 2

Pre-run and post-run verification spectra for the SGLS were evaluated. Some of these spectra are the same as for borehole 299-E33-81. The pre-survey verification spectra were within the control limits. The post-survey verification (file B0048CAA) was outside of the control limits. The peak counts per second for the 1461-keV peak and the 609-keV peak were below the lower control limits for this post-run verification spectrum. Examinations of spectra from this log run indicate that the detector appears to have functioned normally during the log run, and the spectra are provisionally accepted. The post-survey verification spectrum (file B0049CAA) met the acceptance criteria.

Individual spectra were processed in batch mode using APTEC Supervisor. Concentrations were calculated in EXCEL, using parameters determined from analysis of calibration data collected in August 2000. The casing configuration was assumed to be one string of 8-in. casing with a thickness of 5/16 inches. These assumptions are consistent with the logging engineer's measurements. Zero reference is the top of the casing. Water and dead time corrections were not needed.

Log Plot Notes:

Separate log plots are provided for gross gamma and dead time, naturally occurring radionuclides (^{40}K, ^{238}U, and ^{232}Th), and ^{137}Cs. For each radionuclide, the energy value of the spectral peak used for quantification is indicated. Unless otherwise noted, all radionuclides are plotted in picocuries per gram (pCi/g). The open circles indicate the minimum detectable activity (MDA) for each radionuclide. Error bars on each plot represent error associated with counting statistics only and do not include errors associated with the inverse efficiency function, dead time correction, or casing correction. These errors are discussed in the calibration report. A combination plot is also included to facilitate correlation.

Results and Interpretations:

^{137}Cs, which is a man-made radionuclide, was detected in this borehole. Near ground surface (log depth 2.0 ft), ^{137}Cs was observed with an activity of 3.9 pCi/g. ^{137}Cs occurred between 2.5 and 8.0 ft at activities ranging from 0.2 pCi/g at 8.0 ft to 0.9 pCi/g at 2.5 ft.

The changes in gross gamma counts depend primarily upon changes in ^{40}K activities. The increase in gross gamma counts from about 140 cps at about 12 ft to about 165 cps at a log depth of about 20 ft corresponds with an increase in apparent ^{40}K activity from about 13 to 17 pCi/g. This increase in total gamma is interpreted as the Hanford H2.

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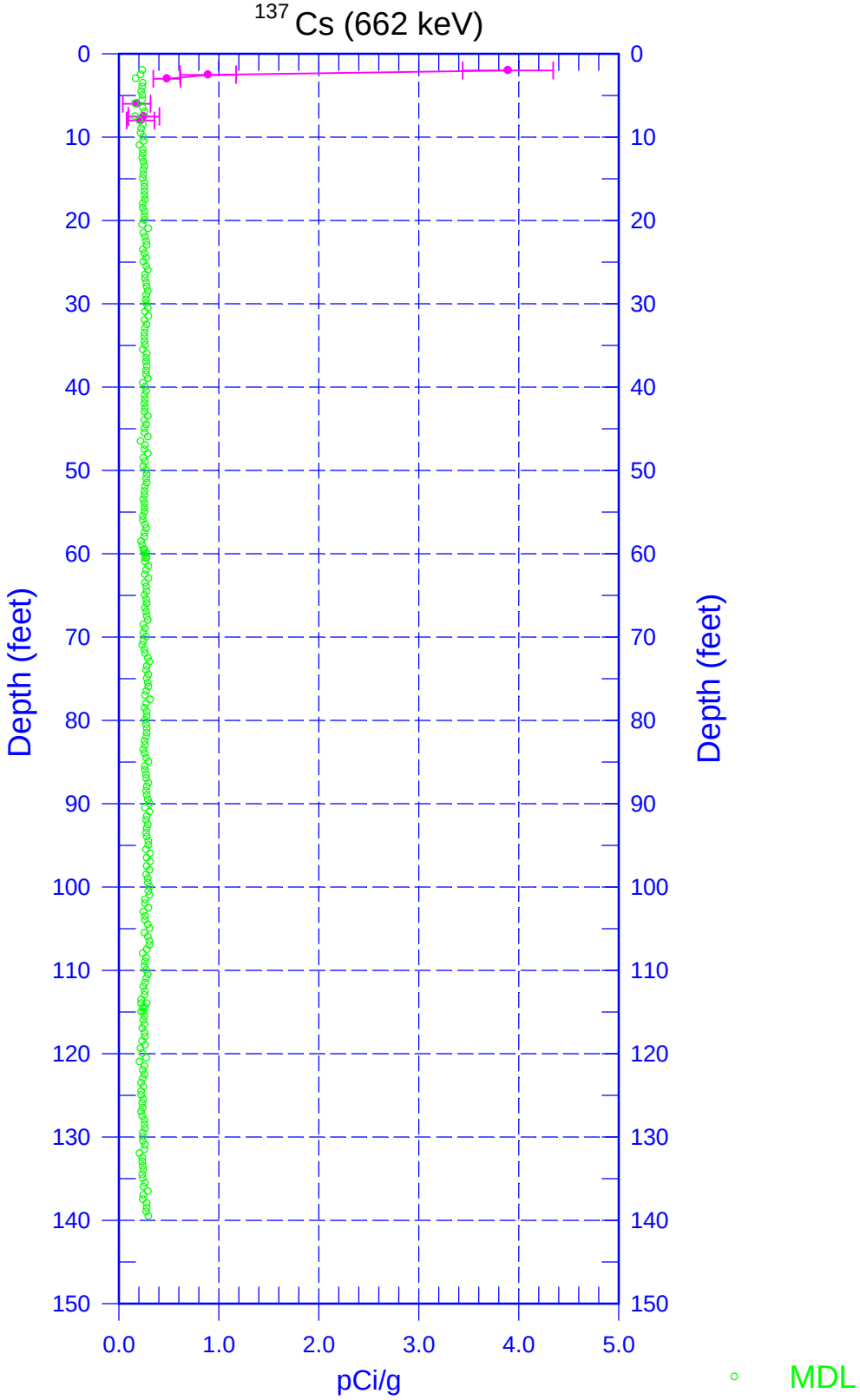
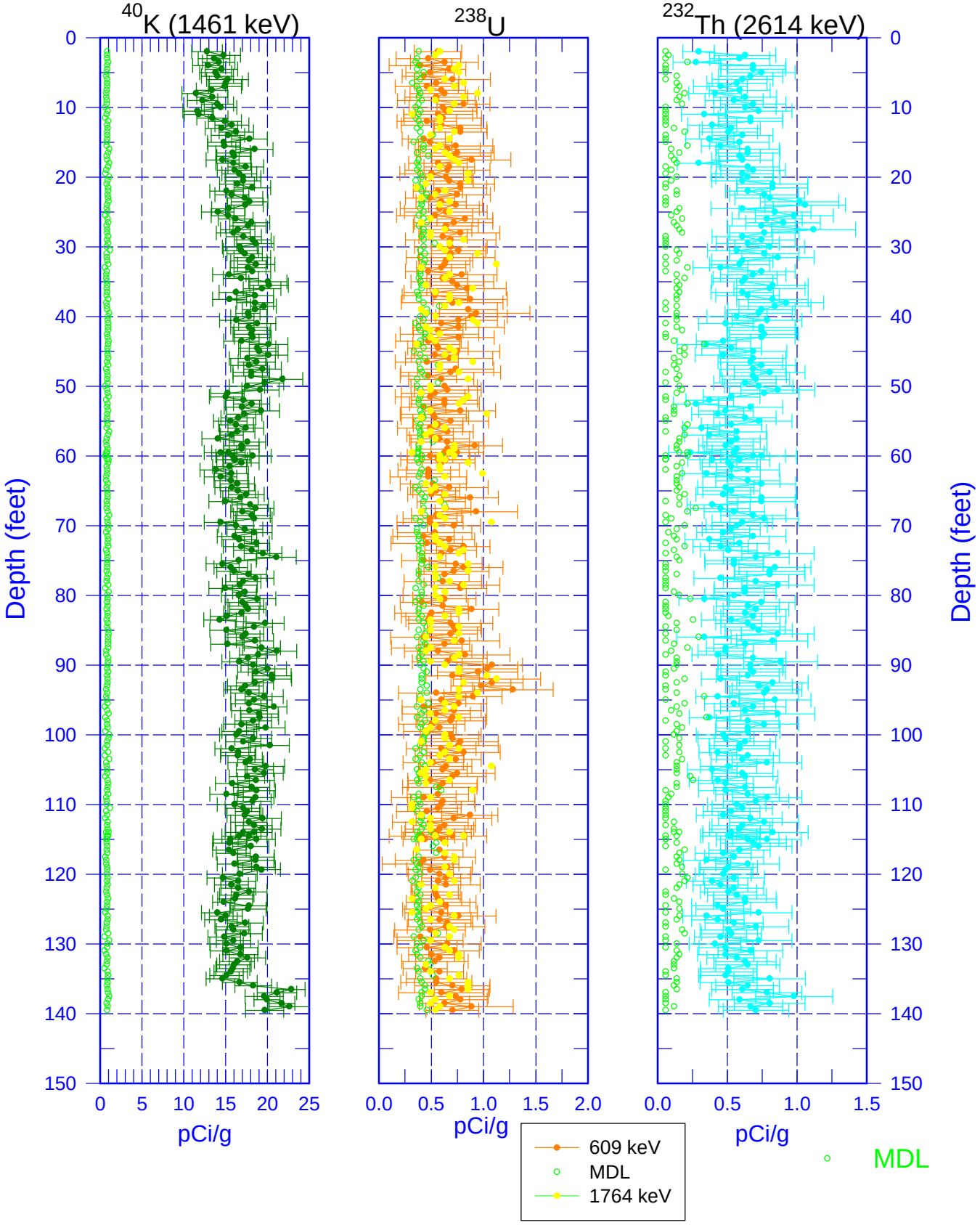
[1] GWL – groundwater level
[2] TOC – top of casing
[3] N/A – not applicable

299-E33-76 (A6884)

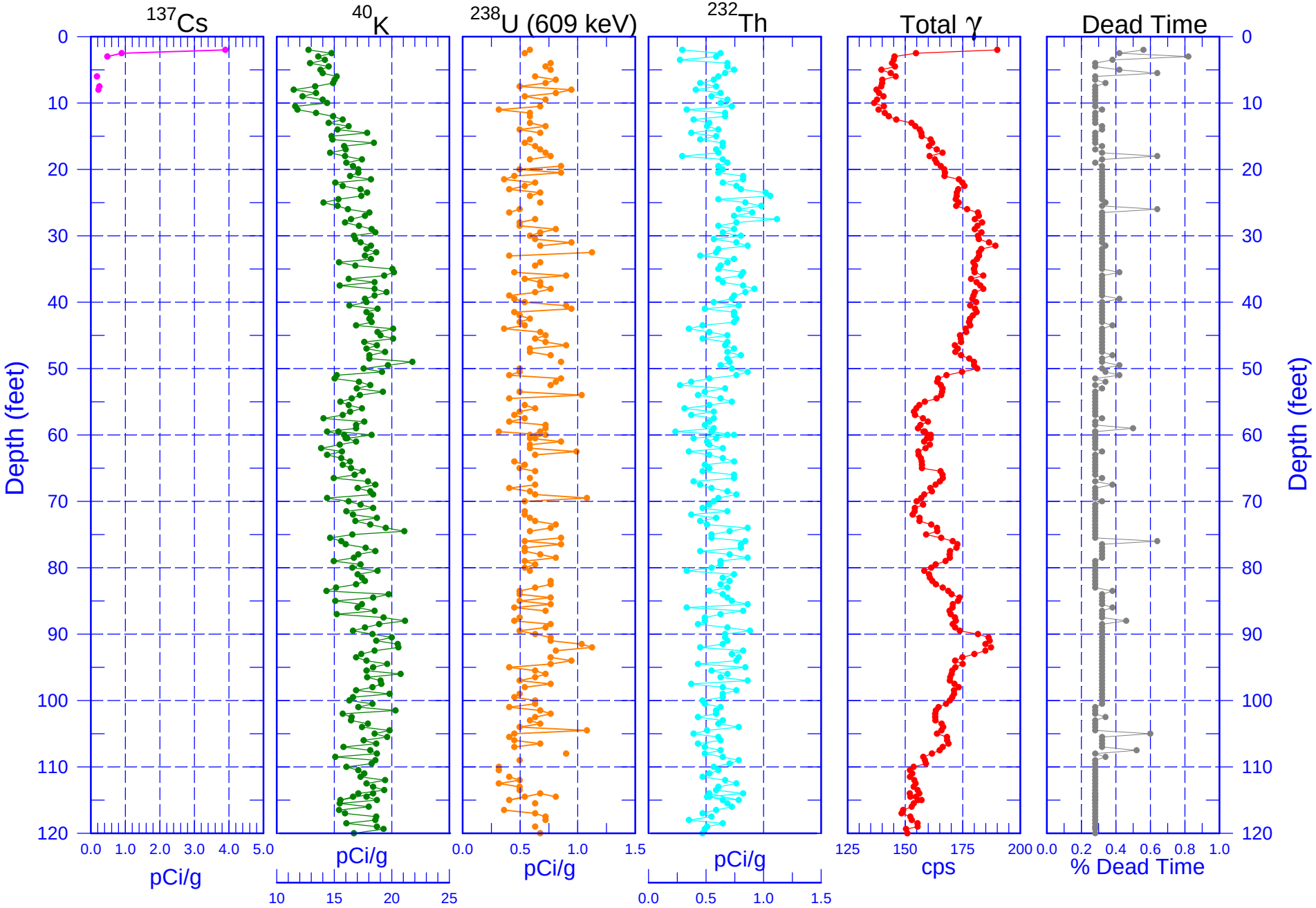
Man-Made Radionuclide Concentrations



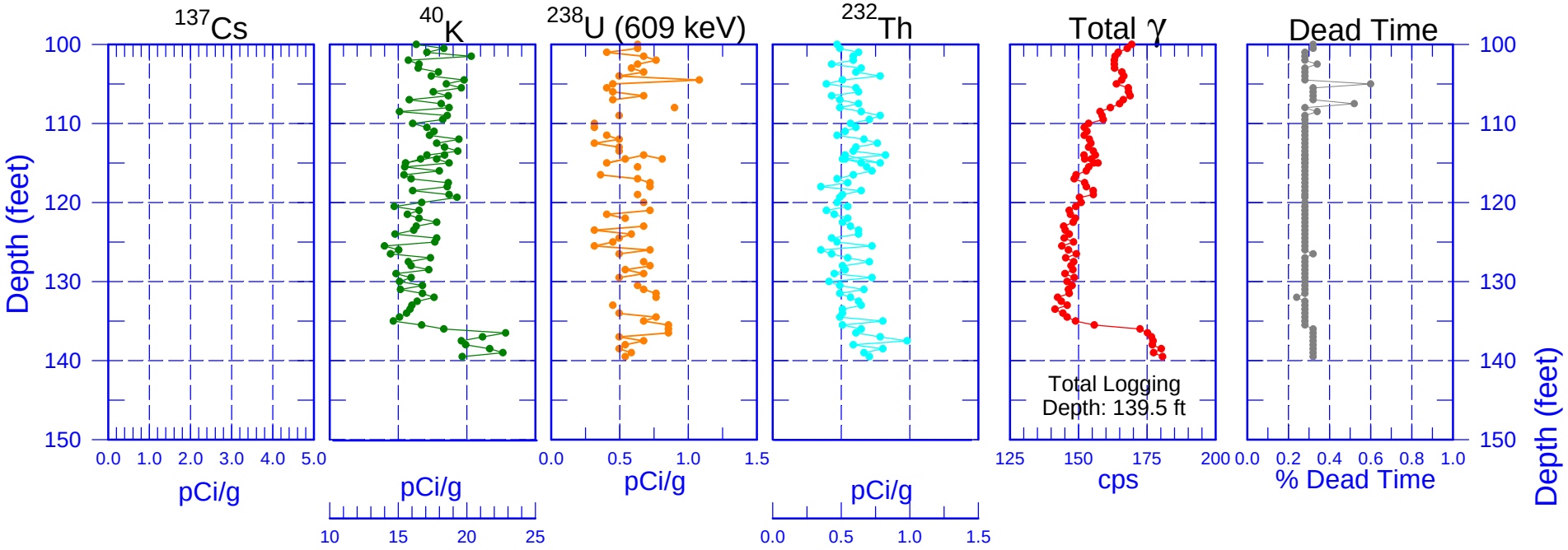
299-E33-76 (A6884)
Natural Gamma Logs



299-E33-76 (A6884) Combination Plot

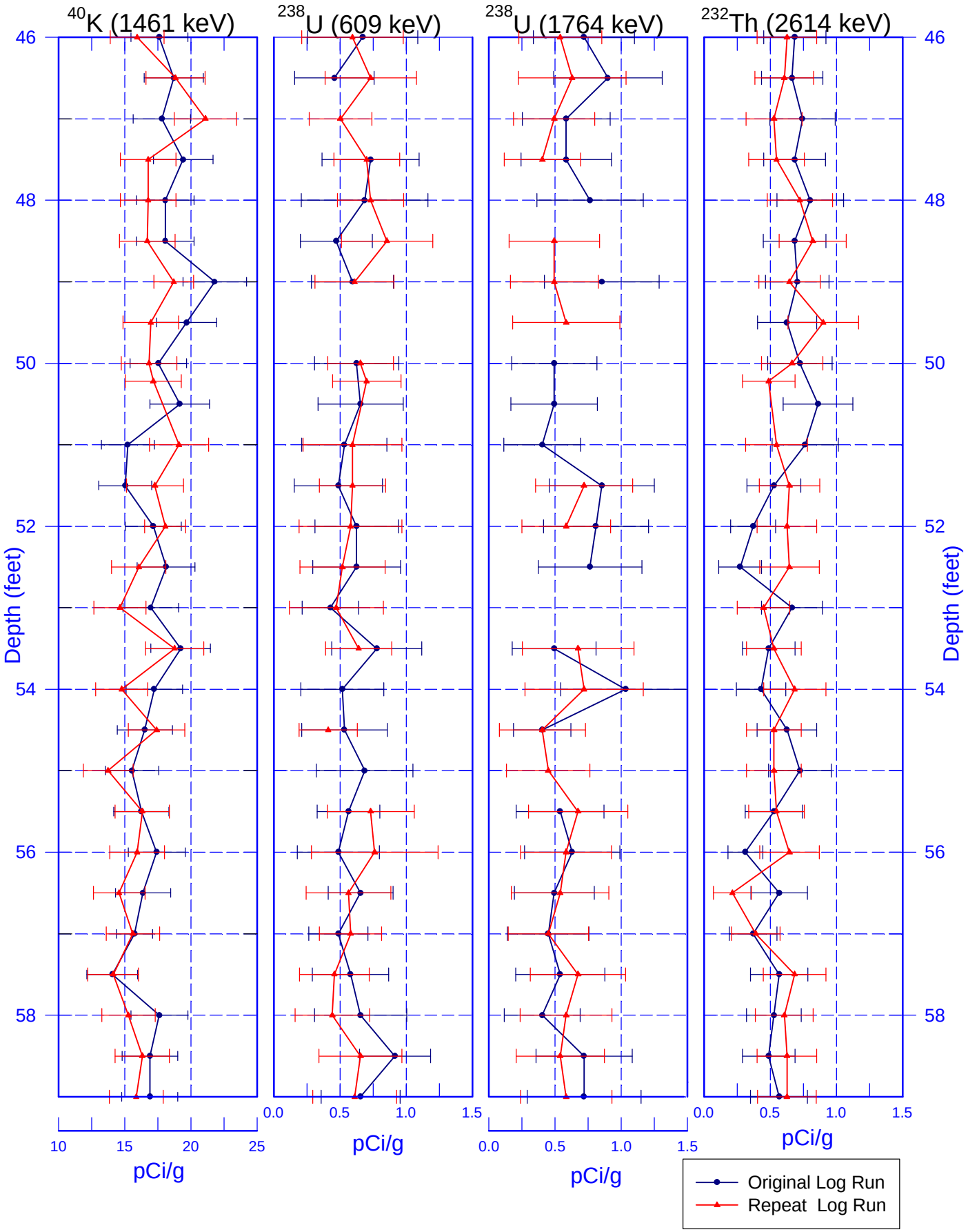


299-E33-76 (A6884) Combination Plot



299-E33-76 (A6884)

Rerun of Natural Gamma Logs



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Total Gamma & Dead Time